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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/410,368 09/30/1999 JOHN R. HAVENS 244/006 6760

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EXAMINER

LIN, JERRY

ART UNIT

PAPER NUMBER

1631

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 09/410,368	Applicant(s) HAVENS ET AL.	
	Examiner Jerry Lin	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,7-9,13,14,16,17,28-32,34,36,37,67,72,73,78-80,87,88 and 90-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,7-9,13,14,16,17,28-32,34,36,37,67,72,73,78-80,87,88 and 90-93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2 pages (12/21/2006)</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicants' arguments, filed December 21, 2006 have been fully considered and they are not deemed to be persuasive. The following rejections are reiterated applied. They constitute the complete set presently being applied to the instant application.

Status of the Claims

Claims 1, 7-9, 13, 14, 16, 17, 28-32, 34, 36, 37, 67, 72, 73, 78-80, 87, 88, 90-93.

Furthermore, the examination of claims 1, 14, and 92 are limited to acetals and esters for the R group.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 7-9, 13-14, 16, 17, 28-32, 34, 67, 72, 73, 78-80, 87-88, and 92 are rejected under 35 U.S.C. 102(e) as being anticipated by Sosnowski et al. (US 2003/0190632 A1).

The instant claims are drawn to a microarray device that includes a microelectrode covered by a permeation that is attached to an X group, which is

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attached to an R group that is activated by a pH change caused by an electric current before the R group binds to a biomolecule.

Regarding claim 1 and 13, Sosnowski et al. teach creating a microarray comprising a plurality of microlocations (page 4, paragraph 0042); each microlocation comprises an underlying working microelectrode on a substrate (page 6, paragraph 0056; page paragraph 0124); which are covered by a permeation layer (page 4, paragraph 0043); which comprises a polymerizable moiety (page 14, paragraphs 0179-0184); a linking moiety X (primary amine or covalent bond) (page 14, paragraph 0183); and a R group (succinimidyl ester) which is activated by running an electronic current which would cause a change in the pH in the overlaying solution (page 25, paragraphs 0300, 0304) before reacting with a biomolecule (DNA) (page 25, paragraph 0304).

Regarding claims 7-9, Sosnowski et al. teach wherein the P is covalently attached to other PXR groups and where the P moieties are the same (page 14, paragraphs 0179-0184).

Regarding claim 14, 78, 79, and 80 Sosnowski et al. teach creating a microarray comprising a plurality of microlocations (page 4, paragraph 0042); each microlocation comprises an underlying working microelectrode on a substrate (page 6, paragraph 0056; page paragraph 0124); which are covered by a permeation layer (page 4, paragraph 0043); which comprises a polymerizable moiety (page 14, paragraphs 0179-0184); a linking moiety X (primary amine) (page 14, paragraph 0183); and a R group (succinimidyl ester) which is activated by running an electronic current which would cause a change in the pH in the overlaying solution (page 25, paragraphs 0300, 0304)

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before reacting with a biomolecule (DNA) (page 25, paragraph 0304); wherein the first and second PXR groups may be the same or different (page 14, paragraph 0179-0184); wherein the P is covalently attached to a permeation layer matrix (page 14, paragraph 0179-0184); wherein the P moieties of the second PXR groups are covalently attached to one other P moieties to form a polymer (page 14, paragraph 0179-0184).

Regarding claim 16, 17, and 34, Sosnowski et al. teach wherein the R are the same for the first and second PXR groups (page 25, paragraph 0300, 0304); and wherein the P requires activation prior to participating in a polymerization reaction (pages 14-15, paragraphs 0184-0185).

Regarding claim 28, 32, and 92, Sosnowski et al. teach creating a microarray comprising a plurality of microlocations (page 4, paragraph 0042); each microlocation comprises an underlying working microelectrode on a substrate (page 6, paragraph 0056; page paragraph 0124); which are covered by a permeation layer P (page 4, paragraph 0043); which comprises a polymerizable moiety (page 14, paragraphs 0179-0184) where the P requires chemical activation (pages 14-15, paragraphs 0184-0185); a linking moiety X (primary amine) (page 14, paragraph 0183); and a R group (succinimidyl ester) which is activated by running an electronic current which would cause a change in the pH in the overlaying solution (page 25, paragraphs 0300, 0304) before reacting with a biomolecule (DNA) (page 25, paragraph 0304); wherein the pH change is produced by electronic potential or by a new buffer (page 25, paragraph 0300-0304) wherein the electronic potential used is at a current density between 50

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nA/5000 μm^2 and 5 μA /5000 μm^2 for a time period between 30-600 seconds (page 25, paragraphs 0300-0304).

Regarding claim 29, 27, 88, Sosnowski et al. disclose wherein the permeation layer is an acrylamide, etc. (pages 14-15, paragraph 0179-0185).

Regarding claim 30, Sosnowski et al. disclose wherein the biomolecule are derivatized (page 20, paragraph 0259).

Regarding claims 31 and 72, Sosnowski et al. teach wherein the P group is a vinyl (hydrogel, which uses acrylates that contain vinyl groups) (page 12, paragraph 0159).

Regarding claims 67 and 73, Sosnowski et al. teach wherein the P group includes amine moieties (page 14, paragraphs 0179-0184).

Response to Arguments

4. The Applicants have responded to this rejection by stating that Sosnowski et al. does not teach activating the R group by a pH change in the overlying solution. The Examiner agrees with the applicant in-part, however, the instant claims remain rejected because of how the claim is written. The instant claims are drawn to a product – a microarray. According to claims 1, 14, and 28, the product comprises of P-X-R. In claims 1, 14, and 28, R may be an acetal or an ester. The Examiner notes that the claim includes a “product-by-process” limitation in regard to the R group, which includes activating the R group by a pH change. This process is discussed in both the Remarks section of the Applications response and in the submitted Declaration. However, a

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"product-by-process" claim may be anticipated by a reference that teaches the product, even if the reference does not teach the process itself. The Examiner agrees that Sosnowski et al. does not teach the process itself. However, Sosnowski et al. does teach a P-X-R which anticipates the instant claims.

This rejection is maintained from the previous office action.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 28, 36, 90, 91, and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sosnowski et al. (US 2003/0190632 A1) in view of Blackburn et al. (US 6,761,816).

The instant claims are drawn to a microarray device that includes a microelectrode covered by a permeation that is attached to an X group which is attached to a thioester moiety.

Sosnowski et al. is applied as above.

Sosnowski et al. do not teach using thioesters in the R group.

Blackburn et al. teach wherein the R group includes thioesters (column 27, lines 1-10, 35-43; column 28, lines 5-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the devices of Sosnowski et al. and Blackburn et al. Blackburn et al. teach that increased solubility is desired with an oligmer that is attached to an electrode (column 26, lines 50-65). Sosnowski et al. also teach a method wherein biomolecules are also attached to an electrode (abstract). Thus one of ordinary skill in the art making Sosnowski et al.'s device also be motivated to ensure that the attached oligmer have increase solubility as advised by Blackburn et al. Blackburn et al. suggest some suitable R groups that increase solubility (column 27, lines 1-10). One of ordinary skill in the art would use the R groups (including thioesters) suggested by Blackburn et al. to create oligmers with increased solubility in Sosnowski et al.'s method.

Response to Arguments

7. The Applicants have replied to this rejection by arguing that Sosnowski et al. does not teach activating the R group by a pH change in the overlying solution. See above for the Examiner's response.

This rejection is maintained form the previous office action.

8. Claims 28 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sosnowski et al. (US 2003/0190632 A1) in view of Bryan et al. (US 6,458,547).

The instant claims are drawn to a microarray device that includes a microelectrode covered by a permeation that is attached to an X group, which is attached to an acetal moiety.

Sosnowski et al. is applied as above.

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Sosnowski et al. do not teach using acetals in the R group.

Bryan et al. teach wherein the R group includes acetals (column 13, line 52-column 14, line 13).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the devices of Sosnowski et al. and Bryan et al. Bryan et al. teach different methods of attaching different biomolecules to an array that includes a permeation layer over an electrode (abstract, column 13, line 52-column 13, line 13). Sosnowski et al. teach that a variety of biomolecules may be used on their array (page 5, paragraph 0050). However Sosnowski et al. do not specifically teach which method or functional groups are best suited for attaching certain biomolecules to their array. Thus one of ordinary skill in the art would be motivated to find how to attach a biomolecule of interest to the device of Sosnowski et al. Since Bryan et al. teach different methods of attaching different biomolecule to an array, one of ordinary skill in the art would be motivated to use Bryan et al.'s method on Sosnowski et al.'s device to attach different biomolecules to the array.

Response to Arguments

9. The Applicants have replied to this rejection by arguing that Sosnowski et al. does not teach activating the R group by a pH change in the overlying solution. See above for the Examiner's response.

This rejection is maintained from the previous office action.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Lin whose telephone number is (571) 272-2561. The examiner can normally be reached on 10:00-6:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Irem Yucel can be reached on (571) 272-0781. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JL

MICHAEL BORIN, PH.D
PRIMARY EXAMINER

